Stictocardia Hallier f. (Convolvulaceae) in Queensland

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Summary

Johnson, R.W. (2004). *Stictocardia* Hallier f. (Convolvulaceae) in Queensland. *Austrobaileya* 6 (4): 631-637. Two species of *Stictocardia* are recognised from Queensland. A new combination *S. queenslandica* (Domin) R.W.Johnson, based on *Argyreia queenslandica* Domin, is made. A key to identify both species is provided, together with descriptions, distribution maps and illustrations of certain diagnostic characters.

Keywords: Convolvulaceae, Stictocardia, Queensland, Australia

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Introduction

The genus *Stictocardia* was described by Hallier (1893) to include three species, one of which was *Stictocardia tiliifolia* (Desr.) Hallier f. A few specimens of *S. tiliifolia* had been collected from the Rockhampton and Rockingham Bay regions of Queensland in the late 1880's when they were identified as *Ipomoea grandiflora* Lam. (Mueller, 1889; Bailey, 1901). It was not until Ooststroom (1943) that the transfer of this taxon to *Stictocardia* was recognised in Australia.

In 1928 Domin described Argyreia queenslandica from a flowering specimen he collected near Mungana in 1910. He ascribed the species to the genus Argyreia. At that time he recognised two other species of Argyreia as occurring in Australia. A. soutteri (F.M.Bailey) Domin, which he transferred from the genus Lettsomia, is now known only from the type collection and now presumed extinct, while A. nervosa (Burm.f.) Bojer, an introduced species, is widely naturalised in north Queensland.

In recent years, fruiting material of *Argyreia queenslandica* has been collected from the type locality and surrounding areas. The presence of minute black glands on the underside of the leaves and the enlarged calyx which completely encloses the fruit, clearly requires the transfer of this species to the genus *Stictocardia*.

Classification

Stictocardia is regarded as a member of the tribe Argyreieae (Hallier 1893; Austin & Demissew 1997). The only other members of this tribe in Australia are the introduced *Argyreia nervosa* and the enigmatic *A. soutteri*.

Taxonomy

Stictocardia Hallier f., in Engl. Bot. Jahrb. 18: 159 (1893); Ooststr., Blumea 5: 346, fig. 1, g-h (1943); Fl. Males., ser. 1, 4(4): 491 (1953). Type: Stictocardia tiliifolia (Desr.) Hallier f. ("tiliaefolia"), based on Convolvulus tiliifolia Desr. ("tiliaefolia").

Annual to woody perennial with trailing and twining stems. Cotyledons bilobed, with the lobes ovate-oblong, diverging and greatly exceeding the base. Leaves ovate or orbicular, mainly cordate at the base, the lower surface with many minute glands. Inflorescence axillary, cymose, 1-many flowered; bracts deciduous. Sepals 5, subequal, elliptic or orbicular, obtuse to emarginate, subcoriaceous, often with thinner margin, much accrescent in fruit. Corolla red or purple, large, funnelshaped, the midpetaline bands often somewhat pilose outside or at the distal end and with minute glands like the leaves. Stamens and style included. Filaments inserted near the corolla base; pollen grains spheroidal and polypantoporate with a spinulose surface. Ovary glabrous, 4-celled, each cell with 1 ovule; style 1, stigma biglobular. Fruit much

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enclosed by the much-enlarged calyx, globular, dissepiments with 2 transverse wings at the surface of the fruit, dehiscing irregularly between the wings exposing 4 pubescent seeds.

Distribution: Stictocardia is a pantropical genus of 10 species (Austin & Eich 2001). The species occur primarily in the tropics of Africa, Asia and Australia with only *S. tiliifolia* extending into tropical America as an introduction (Austin & Demissew 1997). *Stictocardia tiliifolia* has been recorded from tropical Australia (Johnson 1983), though Austin & Eich (2001) in their synopsis did not cite any records from Australia. A second species in the genus, described originally as *Argyreia queenslandica*, is endemic to northeastern Australia.

Etymology: The generic name is derived from the Greek, *stiktos* for dotted, and *kardia* for heart-shaped, referring to the broadly ovate, cordate leaves dotted with glands on the lower side, a feature characteristic of the genus.

Key to species of Stictocardia in Queensland

- 1. Stictocardia queenslandica (Domin) R.W.Johnson, comb. nov. Argyreia queenslandica Domin, Biblioth. Bot. 89: 1087 (1928). Type: Queensland: Nord-Queensland: am fusse eines Karsthugels bei Mungana, Domin II. 1910 (holo: PR; photo BRI).

Annual or perennial with trailing and twining stems; cotyledons deeply bi-lobed (Fig. 1); stems terete, herbaceous, sparsely hairy to ± glabrous, with short, spreading to \pm appressed, tubercle-based hairs, 0.1-0.2 mm long. Leaves petiolate; petiole 2-15 cm long, slightly channelled above, hairy as for stem, 0.6-1.4 times as long as the blade; blade simple, broadly ovate, occasionally ovate- to oblong-elliptic, often shortly acuminate, 8-18 cm long, 6-15 cm wide with a L:W ratio of 1.1 to 1.4, apex narrowly obtuse, mucronate, base cordate often with an oblong sinus, 15-25% of the blade length, discolorous, darker green above, the underside covered with dark green to black glandular pits, sparsely hairy to ±glabrous, occasionally moderately hairy on both sides, hairs short, weakly erect to ascending, 0.1–0.2 mm long, midrib with 6-8 secondary veins per side. Inflorescence axillary, cymose, usually simple, occasionally compound, bearing 1-2, rarely 3 flowers, occasionally with 2 inflorescences per axil, often with glandular pits on peduncles, pedicels and sepals; peduncle terete, stout, 0.4-2.0 cm long, extending to 3.0 cm at fruiting, glabrous to very sparsely hairy; bracts opposite to sub-opposite, herbaceous, oblong, 2.5-4 mm long, 1-1.8 mm wide, apex rounded to barely acute, ciliate, face \pm glabrous, with a raised midrib, abscissing when in bud or early flowering; pedicels terete, thicker than the peduncle, flattened and dilated and becoming angular upwards, 0.7-1.2 cm long, extending to 1.7 cm at fruiting, glabrous or with an occasional hair. Sepals concave, thick, ±fleshy, with a narrow hyaline margin, becoming leathery and enclosing the capsule at fruiting; outer sepals broadly ovate to ovateorbicular, 1.0-1.5 cm long, 1.4-2.0 cm wide, expanding to $2.5 \text{ cm} \times 3.5 \text{ cm}$ at fruiting, apex obtuse, base truncate to slightly cordate, glabrous except for some short marginal and ciliate hairs; inner sepals orbicular to ovate or oblong-orbicular, 1.2–1.6 cm long, 1.0–1.6 cm wide, expanding to $2.5 \text{ cm} \times 2.7 \text{ cm}$ at fruiting (Fig. 3A), apex obtuse to rounded, emarginate, base \pm rounded to truncate, glabrous. Corolla funnel-shaped, limb purple to reddish-purple with darker purple inner throat and midpetaline bands, 5.5-6.5 cm long, tube to base of flare 2.0–3.5 cm long, limb 4.5–6 cm diameter, tube at base of flare 0.9–1.3 cm diameter, glabrous except for a few hairs on the midpetaline band towards the limb and a fringe of slender, somewhat sinuate, ciliate hairs, 0.2-0.75 mm long, lining the rim each side of the midpetaline



Fig. 1. Cotyledons of Stictocardia queenslandica from glasshouse specimen grown from Clarkson 3789.

band; petal segments 6.0-7.5 cm long, 2.5-3.7 cm wide at the limb, distally roundedtriangular, sometimes emarginate. Stamens 5, fused for 9–12 mm from the base of the corolla tube, fused area not raised; filaments terete above, flattened and dilated downwards, unequal in length, 1.3-2.1 cm long, densely hairy from just below the point of insertion for 2-5 mm along the filament, hairs reddishpurple, cylindrical, sinuate with small clear club-shaped to cylindrical terminal cells, up to 1.25 mm long; anthers lanceolate, sagittate, 4.0-4.8 mm long, 1.2-1.6 mm wide, apex rounded to truncate, basal lobes rounded, 0.6-0.9 mm long, splitting lengthwise at maturity; pollen globular, spinulose. Ovary ovoid, constricted in the upper part, quadrangular in cross-section, glabrous, 4celled, with 1 ovule per cell, disk prominent, donut-shaped, 5-lobed, 0.4-0.7 mm high, yellowish; style 2.5–3.0 cm long, unbranched, glabrous, bearing a capitate to almost 2-lobed stigma, $2.3-2.4 \text{ mm} \times 1.75-2.0 \text{ mm}$ in crosssection, with laterally compressed conical tubercles bearing short hair-like protuberances. Capsule ovoid to depressed globular-ovoid, rounded-quadrangular in cross section, with thin papery walls, 1.0–1.5 cm high, 1.0–1.7 cm diameter, glabrous, 4-celled, septa persistent at maturity with distal, transverse wings, irregularly dehiscing longitudinally between the wings. Seeds 4, ¼-globular-ovoid, olivebrown to black, 7.5–9 mm long, 6–8 mm wide, moderately to densely pubescent, with short erect to ascending golden brown hairs, 0.1–0.2 mm long somewhat matted, with longer hairs to 1 mm densely clustered on the inner margin of the hilum.

Specimens examined: Queensland. COOK DISTRICT: 16km E of Rookwood Creek, c. 16km W of Chillagoe, Mar 1980, *Clarkson* 3025 (BRI); c. 1km towards Chillagoe from Mungana railway siding, Jun 1981, Clarkson 3789 (BRI); Royal Arch Tower, c. 5km SW of Chillagoe, Mar 1987, *Clarkson* 6837 & *McDonald* (BRI, MBA, QRS, K); The Archways, c. 15km NW of Chillagoe, May 1987, *Clarkson* 6860 & *McDonald* (BRI, MBA); 2km SE of Rookwood Homestead, c. 6km NW of Mungana, Jun 1983, *Conn & De Campo* 1347 (MEL, BRI, MBA); NPR 98, Royal Archway Cave, Mungana, Apr 2000, *Ford* 02382 (QRS, BRI); Wrotham Park – Mungana road, 8km NW of Mungana, Apr 1980, *Johnson* 4043 (BRI).

Distribution and habitat: It is endemic to Australia and is restricted to a small area in the Chillagoe–Mungana area (**Map 1**). It appears to be confined to limestone outcrops and grows in deciduous vine thickets. *Phenology*: Flowers have been recorded from March to June with fruiting occurring soon after flowering. Fruit have been recorded from April to November.

Etymology: The specific epithet refers to Queensland, the state of Australia in which it was discovered.

Notes: It resembles *Stictocardia discolor* Ooststr., based on the description given by Ooststroom (1943), which is known only from one collection from Timor. Both *S. queenslandica* and *S. discolor* have shorter sepals and corollas than *S. tiliifolia*. However *S. discolor* appears to have shorter sepals and longer and more slender peduncles and pedicels than *S. queenslandica*. In addition, *S. discolor* is characterised by a red coloration on the lower leaf surface.

Conservation status: This species is listed as Rare under Queensland Government legislation.

2. Stictocardia tiliifolia (Desr.) Hallier f., Bot. Jahrb. 18: 159 (1893) ("tiliaefolia"); Ooststr. Blumea 5: 346. (1943); Ooststr. Fl. Males. ser. 1, 4: 491. (1953); *Rivea* tiliaefolia (Desr.) Choisy, Mem. Soc. Phys. Geneve 6: 407 (1834); Argyreia tiliaefolia (Desr.) Wight, Icones Pl. Ind. Or. 4(2): 12 t. 1358. (1848); Convolvulus tiliaefolius Desr., in Lam. Encycl. Meth., Bot 3: 544 (1792). Type: Mauritius, Commerson (P, not seen).

Ipomoea grandiflora Lam., Tabl. Encycl. I: 467 (1791).

Woody perennial liana with twining stems; stems terete, herbaceous, moderately hairy with short, weakly ascending, tubercle-based hairs, 0.1–0.4 mm long, becoming woody, reddishpurple in colour, distinctly lenticular and glabrous at the base. Leaves petiolate; petiole 2.5-10 cm long, slightly channelled in the upper half, hairy as for the stem, 0.3–0.9 times as long as the blade; blade simple, broadly ovate to ovate-oblong to almost orbicular, often shortly and abruptly acuminate, (6–) 8–18 cm long, 6–14 cm wide with a L:W ratio of 0.9–1.4, apex acute, occasionally rounded to emarginate, mucronate, base cordate with a broad rounded sinus, 15–27% of the blade length, discolorous, darker green above, the underside covered with dark green to black glandular pits, moderately to sparsely hairy on both sides, hairs short, erect to ascending, 0.1–0.4 mm long, midrib with 6–9 secondary veins per side. Inflorescence axillary, cymose, usually simple, occasionally compound, bearing 1, rarely 2 or 3 flowers, often with glandular pits on peduncles, pedicels and sepals; peduncle terete, stout, 1.5–6.5 cm long, moderately hairy with short sinuate, erect to ascending matted hairs, 0.1-0.4 mm long,; bracts opposite to subopposite, herbaceous, oblong, concave, 4.5-8 mm long, 2.8-4 mm wide, apex rounded, emarginate, mucronulate, sparsely to moderately hairy, occasionally ± glabrous, abscissing when in bud or early flowering; pedicels terete, stout, slightly dilated and angular upwards, 1.0-2.0 cm long, moderately hairy, glabrescent. Sepals concave, thick, ±fleshy, with a narrow hyaline margin, becoming leathery with distinct longitudinal and reticulate venation and enclosing the capsule at fruiting; outer sepals broadly ovate to orbicular or \pm reniform, 1.5–2.0 (–2.2) cm long, 2.0–2.5 cm wide, expanding to 4.5 cm × 5 cm at fruiting (Fig. 3B.), apex rounded, ± emarginate, base rounded to shallowly cordate, moderately to sparsely hairy, glabrescent; inner sepals broadly elliptic to orbicular or obovateorbicular, slightly smaller than the outer, 1.3–1.8 (–2.0) cm long and wide at flowering and expanding at fruiting, apex rounded, emarginate, base \pm rounded to truncate, glabrous. Corolla funnel-shaped, limb purple with darker violet-purple inner throat and midpetaline bands, (6.5-) 7.0-8.5 cm long, tube to base of flare 3-4 cm long, limb 6-9 cm diameter, tube at base of flare 1.5-2 cm diameter, ± glabrous or with scattered hairs on the midpetaline band towards the tip and a fringe of slender, somewhat sinuate, ciliate hairs 0.2-0.75 mm long lining the rim each side of the midpetaline band; petal segments 7.5-10.5 cm long, 3.5-5 cm wide at the limb, distally rounded, emarginate. Stamens 5, fused for 10–13 mm from the base of the corolla tube, fused area not raised; filaments terete above, slightly flattened and dilated downwards, unequal in length, (2.7-) 3.5-4.5 cm long, densely hairy from about the point of insertion for 4-8 mm along the filament, hairs reddishpurple, dense, cylindrical, sinuate with short,

clear, globular to club-shaped terminal cells, to 1.2 mm long; anthers lanceolate, sagittate, 5.0-6.5 mm long, 1.7-2.5 mm wide, apex rounded, bluntly apiculate, basal lobes rounded, 1.0-1.4 mm long, splitting lengthwise at maturity; pollen globular, spinulose (Fig. 2.). Ovary ovoid, constricted in the upper part, rounded quadrangular in cross-section, glabrous, 4-celled with 1 ovule per cell, disk prominent, donut-shaped, 5-lobed, 0.6–1.0 mm high, golden-yellow; style 4.0-5.7 cm long, unbranched, glabrous, bearing a bi-globular stigma, $2.5-3.0 \text{ mm} \times 1.5-1.8 \text{ mm}$ in crosssection, covered in distinct tubercles bearing short hair-like protuberances. Capsule ovoid, rounded-quadrangular in cross section, 1.5-2 cm high, 1.6–2 cm diameter, glabrous, 4 celled, septa persistent at maturity with distal, transverse wings, irregularly dehiscing longitudinally between the wings. Seeds 4, ¹/₄-globular-ovoid, 8–11 mm long and 6–8 mm wide, brown, densely pubescent with short erect to ascending brown hairs, 0.1-0.2 mm long, somewhat matted with longer hairs to 1 mm densely clustered around the hilum.

Selected specimens examined: Northern Territory. DARWIN AND GULF REGION: GOROMURU River, c. 7 km SE of mouth, 27 Apr 1996, Cowie 6659 & Bokarra (DNA, BRI); Arafura Swamp area near Raminging, Sep 1998, Cowie & Mangion 7963 (DNA, BRI); Arnhem Land, Bennet Bay, Nov 1987 Dunlop 7350 (DNA, BRI); 9 km SW of West Alligator Head, Kakadu, Jun 1988, Russell-Smith 5612 & Lucas. (DNA, BRI); 11 km E Channel Point, Nov 1988, Russell-Smith 6406 & (BRI, DNA). Queensland. COOK DISTRICT: Low Isles, May 1963, Cribb BRIU2839 (BRI), NORTH KENNEDY DISTRICT: Mount Bertha, Gloucester Island, 21 Mar 1994, Batianoff 9403318 & Dillewaard (BRI); nr Port Denison, 1887, Birch s.n. (MEL 95501); Cromarty, Mar 1935, Blake 8318 (BRI); Rockingham Bay, s.d., Dallachy, (MEL95476); Ayr, s.d., Michael 1526 (BRI); Harvey Range, Oct 1929, Pollock s.n. (BRI); Long Island, Jul 1935, White 12157 (BRI). PORT CURTIS DISTRICT: Howard Point, Middle Percy Island, Oct 1989, Batianoff 11706, Champion, Thompson & Dillewaard (BRI); Rockhampton, s.d., Dietrich (MEL 95502). MORETON DISTRICT: Burleigh Heads, Mt Burleigh National Park, 1972, Catherine (BRI).

Distribution and habitat: It is widespread throughout the old world tropics from central and southern Africa through south-east Asia to Australia and islands in the west Pacific Ocean and is naturalised in tropical America. It has been recorded along the coast of northern and north-eastern Australia from east of Darwin to Burleigh Heads, SE of Brisbane (**Map 1**). It grows mainly in coastal vine forests; occasionally in coastal eucalypt open forests. **Phenology:** Flowers have been recorded from March to July and fruit from July to November.

Etymology: The specific epithet refers to the shape of the leaves which resemble those of the Linden or lime tree (*Tilia* spp.)

Conservation status: This species is currently not considered to be rare or endangered.

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Map 1. Distribution of Stictocardia queenslandica and S. tiliifolia.



Fig. 2. Pollen grain of Stictocardia tiliifolia from Dunlop 2782 (AD).



Fig. 3. Fruiting calyx of A. *Stictocardia queenslandica* - (glasshouse specimen (*Calway* BRI-AQ378863), grown from seed of *Clarkson* 3789 × 1.5) and B. *S. tiliifolia* – (*Pollock* s.n. (BRI-AQ 277029) × 1.5)